



Family Health Dataline

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- In Alaska, adding hemoglobinopathies to the newborn screening panel will be most cost-effective if only black infants are screened and if interventions are offered only to those persons with clinically significant conditions.
- A series of clinics for children exposed to alcohol in-utero were useful for identifying children with deficits and referring them for services but not for identifying children with a diagnosis of fetal alcohol syndrome.
- Many of the *Streptococcus pneumoniae* organisms in the Yukon-Kuskokwim Delta which are non-susceptible to antimicrobial drugs may have originated from a single clone.
- Teenage suicide rates in Alaska have increased during 1979-93 primarily because of increasing rates among the youngest teens.

Miscellany

In this issue we present abstracts of nearly completed work conducted partially or entirely through the Section of Maternal, Child, and Family Health. We present this information to make the data more timely. We will present more detailed information following completion of the work. Persons interested in more detailed information immediately should contact the Dataline editor.

A Cost -Effectiveness Evaluation of Newborn Hemoglobinopathy Screening in Alaska.

Bradford D. Gessner, Steven M. Teutsch, Phaedra A. Shaffer

Background: The National Institutes of Health Consensus Development Panel has recommended universal newborn screening for hemoglobinopathies (for example, sickle cell disease and the thalassemias), a policy which has been followed by most states. Early detection of newborns with hemoglobinopathies would allow implementation of prophylactic penicillin therapy to prevent pneumococcal sepsis.

Objective: To determine the most cost-effective strategy for newborn hemoglobinopathy screening from the perspective of the state health care system in Alaska.

Study design: We used decision analysis to compare a policy of no screening to four different screening and follow-up options: universal screening or screening targeted to black infants with selective follow-up only of infants who are homozygous or compound heterozygous for an abnormal hemoglobin variant (i.e., only those infants with a clinically significant condition) and universal or targeted screening with complete follow-up, including follow-up of infants with clinically insignificant hemoglobin traits.

Results: Universal hemoglobinopathy screening with either complete or selective follow-up would prevent 0.039 deaths per year in Alaska while targeted screening with either complete or selective follow-up would prevent 0.026 deaths per year. Universal screening with complete follow-up would cost \$1,780,000 per life saved compared to \$654,000 per life saved for targeted screening with complete follow-up. Universal screening with selective follow-up would cost \$817,000 per life saved while targeted screening with selective follow-up would cost \$206,000 per life saved. For either complete or selective follow-up, the incremental cost of universal versus targeted screening would be over \$2,000,000 per life saved. Results of this analysis were most sensitive to changes in the estimates of the sickle cell disease prevalence, the cost of the hemoglobin electrophoresis, and the cost of determining the race of the infant.

Conclusions: For Alaska, targeted screening with selective follow-up represents the most cost-effective newborn hemoglobinopathy screening option. This conclusion may change with changes in the sickle cell disease prevalence and test cost. Ethical and legal issues may also influence which newborn hemoglobinopathy screening program is implemented.

An Evaluation of a Series of Diagnostic Clinics for Children Exposed to Alcohol In-Utero.

Bradford D. Gessner, Carl Li, Sterling K. Clarren, Ronald E. Brennan

Background: In addition to characteristic facial features and growth delay, in-utero alcohol exposure may result in developmental delay, behavioral anomalies, and central nervous system anomalies. These outcomes may have long-term effects on family integration, school performance, and productivity in society. For these reasons, the Alaska Division of Public Health has made the identification and provision of services to children exposed to alcohol in-utero one of its highest priorities

Objective: To describe findings from a series of clinics held in Alaska for children exposed to alcohol in-utero and to provide services to all children in a defined area with serious effects of in-utero alcohol exposure.

Study Design: We obtained information for 58 children who attended one of five diagnostic clinics, held in four of the five largest Alaskan cities, for children exposed to alcohol in-utero. Additionally, we obtained information on the biologic parents of these children. Information was collected from a clinical evaluation, medical chart review, and a questionnaire administered to the guardians of the children.

Results: Although 66% of children had at least one characteristic facial anomaly, 57% had growth deficiency, and 83% had neurologic impairment - most commonly developmental delay - only four received a diagnosis of fetal alcohol syndrome (FAS). A further 39 children had effects related to FAS but not the fully expressed FAS phenotype. Most children (61%) did not live with their biologic parents, 53% had a history of experiencing abuse, and 45% had received special education services. Many biologic parents had a history of poor education, arrest or incarceration, suicide attempts, a learning disability, a psychiatric condition, or experiencing abuse as children. Overall, 86% of children were connected with new services through the diagnostic clinics.

Conclusions: These clinics identified children with adverse outcomes related to in-utero alcohol exposure, although few with the full FAS phenotype. The clinics were useful for identifying and referring for services children who had lived in dysfunctional environments and who had mild to moderate physical and intellectual deficits. If clinics such as these are to serve a useful role in FAS surveillance, more efficient screening criteria must be developed.

Risk Factors for Nasopharyngeal Carriage of Non-susceptible Pneumococcus and Detection of a Multiply Resistant Clone among Children Living in the Yukon-Kuskokwim Delta Region of Alaska.

Xilla T. Ussery, Bradford D. Gessner, Harvey Lipman, John A. Elliott, Marilyn J. Crain, Phyllis C. Tien, Alan J. Parkinson, Michael Davidson, Richard R. Facklam, Robert F. Breiman

Background: *Streptococcus pneumoniae* frequently causes meningitis, bacteremia and acute otitis media among children. Unfortunately, this organism has become increasingly non-susceptible to antimicrobial agents, particularly among children living in the Yukon-Kuskokwim Region of Alaska.

Objective: To determine the prevalence of and risk factors for asymptomatic nasopharyngeal (NP) carriage with non-susceptible *Streptococcus pneumoniae* and to compare pneumococcal serotypes and drug susceptibility patterns between NP and invasive isolates.

Methods: We cultured nasopharyngeal (NP) secretions of healthy children ≤ 5 years of age, reviewed their hospital records, and administered questionnaires to accompanying parents. Additionally, we determined capsular serotypes, pneumococcal surface protein A serotypes, and drug susceptibility patterns for these NP isolates and for pneumococcal isolates which caused invasive illness during 1992.

Results: Of 185 children evaluated, 92 (50%) had pneumococcus isolated from NP secretions; of these, 33 (36%) were non-susceptible to at least one drug or drug class tested, including 27 (29%) that were non-susceptible to penicillin. Of 23 capsular serotype 6B isolates, 21 were non-susceptible to at least one drug compared to 12 of 69 other isolates (relative risk [RR] 5.3, $p < 0.001$); 17 capsular serotype 6B isolates were non-susceptible to more than one drug compared to 3 other isolates (RR 17.0, $p < 0.001$). The majority of 6B isolates had identical pneumococcal surface protein A patterns suggesting they originated from a single clone. Carriage of non-susceptible Sp was associated with age < 2 years (RR 3.0, $p < 0.001$) but not with patterns of antibiotic use or other evaluated risk factors. NP and invasive Sp isolates had similar capsular serotype and drug susceptibility patterns.

Conclusion: We conclude that carriage of and invasive disease resulting from non-susceptible Sp, primarily capsular serotype 6B, is common among children from the Yukon-Kuskokwim Delta in Alaska, particularly children less than 2 years of age. This suggests a need for continuing surveillance of Sp drug susceptibility patterns to guide antimicrobial therapy. The similarity in drug susceptibility patterns between NP and invasive isolates suggests that NP isolates may provide an adequate surveillance method to guide empiric antimicrobial therapy.

Temporal and Geographic Trends of Teen Suicide in Alaska, 1979-93.

Bradford D. Gessner

Background: Teenage suicide rates have increased nationwide, including in Alaska. While the cause for this increase is unknown, individual and societal risk factors may independently influence suicide rates and thus each may suggest avenues for intervention.

Objectives: To document trends in suicide rates among persons 14 to 19 years of age in Alaska and to determine the association between census area level teenage suicide rates and demographic features.

Methods: The author examined data from death certificates and from data collected during the 1990 U.S. census.

Results: During 1979-93, 216 teenagers committed suicide, an incidence rate of 31.5 per 100,000 persons per year. From 1979-81 to 1991-93, the suicide rate tripled for persons 14 to 15 years of age and doubled for persons 16 to 17 years of age. Alaska Native males had the highest suicide rate at 120.3 per 100,000 persons per year, a risk ratio of 12.7 (95% confidence interval, 7.9 to 20.2) when compared to white females, the

group with the lowest suicide rate. Among 25 census areas in Alaska, suicide rates varied from 0 to 182.8 per 100,000 persons per year; four census areas had a suicide rate significantly higher, at the 95 percent confidence interval, from Anchorage, including Bethel, Nome, Northwest Arctic Borough, and Wade-Hampton. Census area level suicide rates correlated inversely with the percentage of all households in a census area headed by a married couple but not with per capita income, the percentage of residents over 25 years of age with a high school educa-

tion, the percentage of persons at least 16 years of age in the civilian labor force who were unemployed, and population size.

Conclusions: Alaska has one of the highest teen suicide rates in the country particularly among Alaska Native males. The rate has increased during 1979-93, primarily among the youngest age groups. The proportion of families headed by a married couple in a community may influence teen suicide rates.

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